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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/814,830
Filing Date: March 31, 2004
Appellant(s): BAUMGARTNER ET AL.

Tait R. Swanson
General Electric Company
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed April 11, 2007 appealing from the Office action mailed on February 12, 2007.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The amendment after final rejection filed on 08/29/06 has not been entered.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

Claims 1, 3, 7, 9, 12, 14 - 15, 17-18, 21, 23 as amended are rejected under 35 U.S.C. 103(a) as being unpatentable over Emery (US6610011, of record).

Claims 4, 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Emery as applied to claims 3, or 18, and further in view of Chiang et al. (US5957846).

Claims 5 -6, 20, 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Emery as applied to claims 1, 18 or 23, and further in view of Akisada et al. (US6183426, of record).

Claim 8, 10-11, 13, 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Emery as applied to claim 1, and further in view of Whitney et al. (US5396891, of record).

NEW GROUND(S) OF REJECTION

Claims 9-21 and 23 are rejected under 35 U.S.C. 112, first paragraph.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

6,610,011	Emery	8-2003
5,957,846	Chiang et al.	9-1999
6,183,426	Akisada et al.	2-2001
5,396,891	Whitney et al.	3-1995

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

Claims 1, 3, 7, 9, 12, 14 - 15, 17-18, 21, 23 as amended are rejected under 35 U.S.C. 103(a) as being unpatentable over Emery (US 6,610,011).

Emory is directed to the structure or manufacture and use of an ultrasound scanning probe having a transducer array and an engagement sensing mechanism for sensing engaging contact with the subject scanned such that applied power towards scanning may be increased. Whereas Emery in the main would teach evaluation of the

reflected ultrasound towards the contact monitoring purpose, col. 5 line 59 - col. 6 line 12 suggest that, alternative to the reflected ultrasound-based algorithm control, one may use physical sensors in the probe to detect use and provide feedback control, including sensors of motion, tissue reflectivity or thermal sensors. Although Emery does not explicitly state that these independent physical sensors detect 'engagement with the subject' as called for in the claim to the degree of inherency necessary for anticipation (since motion might conceivably include handling motion by the operator, tissue reflectivity might indicate proximation prior to engagement, thermal might pertain to self-heating due to activation and so on), it would have been inherently obvious to use at least the tissue reflectivity sensor to sense active engagement with the subject. In effect this is tantamount to the distance (proximity) sensor which applicants list in specification paragraph [0015] as a category of physical sensor.

Since Emery entertains pick up by the user, this implies a handheld probe body. For temperature to be used for proximity sensing of the body a differential change of measurement must be had with respect to the hand holdable probe.

Claims 4, 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Emery as applied to claims 3, 18 above, and further in view of Chiang et al (US5957846) since whereas the former is a beamformer system with a handheld scanhead the patent does not teach placing the beamformer within a handholdable body portion. However it would have been obvious in view of the latter for example 10, 26 of Fig. 4 and e.g. Fig. 33 and col. 32 discussion to place the beamformer within the scanhead for portability whereupon the heat dissipation requirement becomes greater

as per 1045 in the col. 32 discussion. Such that the Emery technique would be advantageous if portable beamforming is practiced.

Claims 5 -6, 20, 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Emery as applied to claims 1, 18 or 23 above, and further in view of Akisada et al (US6183426) insofar as whereas the former does not suggest a pressure sensor apart from the ultrasonic piezoelectric elements, it would have been obvious in view of Akisada et al to use a pressure-sensitive element to detect loading since Akisada et al suggests in col. 1 that the applicable background to his invention is both diagnosis and therapy; Emery evidencing the use of piezoelectric material per se for physical engagement sensing and the use of a thermal sensor as well as suggesting using combined sensor combinations.

Claim 8, 10-11, 13, 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Emery as applied to claim 1 above, and further in view of Whitney et al (US5396891) since whereas the former does not entertain such for proximity sensing, it would have been obvious in view of the latter to use a manually operable switch to sense physical body contact as a form of coupling engagement.

NEW GROUND(S) OF REJECTION

Claim Rejections - 35 USC § 112

Claims 9-21 and 23 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to

one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The original disclosure fails to specify that the sensor is **non-ultrasonic** and detects proximity **non-ultrasonically** as now claimed. Therefore these limitations are considered to be new matter.

(10) Response to Argument

In response to appellant's arguments arguing that there is no motivation with respect to the rejection of claims 1, 3, 7, 9, 12, 14-15, 17-18, 21 and 23. The examiner notes for the record that "While there must be some teaching, reason, suggestion, or motivation that the references be combined to arrive at the claimed invention, there is no requirement that the references explicitly suggest the combination. ***In re Nilssen***, 851 Fl.2d1401, 1403, 7 USPQ2d 1500, 1502 (Fed. Cir. 1989). The suggestion or motivation to combine the references or teachings can derive from the existence of a teaching, which one of ordinary the art would be presumed to know, and the use of that to solve the same or similar Problem which it addresses. ***In re Wood*** 599 F.2d 1032, 1037, 202 USPQ 171, 174 (CCPA 197b)."

In response to appellant's arguments arguing that the cited references teach away from one another and therefore, are not properly combinable. Simply that there are differences between two references is insufficient to establish that such references "teach away" from any combination thereof. ***In re Beattie***, 974 F.2d 1309, 1312-13, 24 USPQ2d 1040, 1042 (Fed. Cir. 1992).

In relation to the argument pertaining to claim 1, wherein applicant alleges that the cited reference of Emery fails to teach or suggest "**a physical sensor adapted to sense engagement with a subject**, wherein the **physical sensor is independent from the ultrasonic transducer**", the examiner of record notes that both limitations are disclosed by Emery. In column 5 line 59 thru column 6, line 12, the Emery reference does teach the use of physical sensors in the probe to detect use and provide feedback control, including sensors of motion, tissue reflectivity or thermal sensors.

Although Emery does not explicitly state that these independent physical sensors detect **'engagement with the subject'** as called for in the claim to the degree of inherency necessary for anticipation (if the sensor portion of a probe is sensing the amount of light reflected by tissue then the sensor is at least indirectly engaged with the subject because the tissue is part of the subject), it would have been obvious to use at least the tissue reflectivity sensor to sense engagement with the subject in order to determine if the probe is coupling into a reflecting medium such as air or into tissue (subject).

In relation to independent claims 9, 15, 18 and 23 and their dependent claims respectively. The examiner of record maintains the 103 rejections as presented in the previous office action for substantially the same reasons as discussed above with reference to claim 1. Additionally, in response to appellant's argument that Emery does not teach "a controller responsive to the sensor that switches the ultrasound probe between **power modes**", the examiner disagrees with applicant's assertions. In Fig. 4 and in column 5 lines 42 thru column 6 line 18, Emory teaches a system and a method

that detects (*by using motion detectors, optical emitter detector, thermal sensors that provide feedback control*) when an ultrasound transducer is coupling energy into tissue or into the air. In so doing, the thermal performance of the transducer improves allowing an increase in the duration level of excitation voltage used to transmit energy (see abstract).

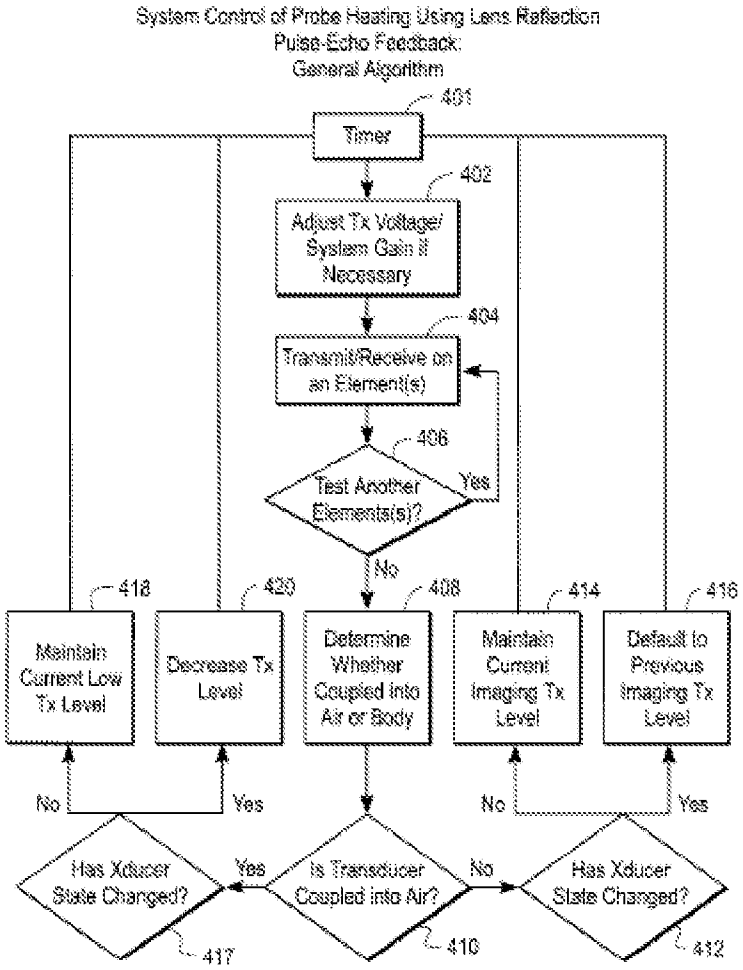

FIG. 4

In relation to independent claim 23 that includes means-plus-function language, as set forth in 35 U.S.C. § 112, paragraph 6. Appellant alleges that proper interpretation

of this claim must be performed with reference to the structure provided by the specifications and argues that the cited reference of Emery fails to teach or suggest such structure with regard to *"means for sensing non-ultrasonic signals to detect physically detecting proximity of an ultrasound module relative to a subject to be scanned by ultrasonic transducers of the ultrasound module"* and with regard to the *"means for switching power modes of the ultrasound probe based on proximity feedback from the means for sensing"* as recited. The examiner of record disagrees with applicant's comments, as argued before in column 5 lines 42 thru column 6 line 18, the specifications of the Emery patent specifically states:

> Referring back to FIG. **4**, next, a specific number of elements must meet these criteria to decide if the entire probe is coupled into air or tissue, via step **410**. If the results indicate the transducer is coupled into tissue, then the system must know what the previous state of the system is, via step **412**. If previously, the transducer was coupled into tissue, then the same imaging transmit levels are maintained, via step **414**. If previously the transducer was coupled into air and now it is coupled to tissue, then the system should default to the previous imaging transmit level, via step **416**.
>
> Next, suppose the results suggest the transducer is coupled into air. Again the previous state of the transducer must be determined, via step **417**. If previously the transducer was coupled into air, then the current low transmit level is maintained, via step **418**. However, if the probe was previously imaging and the transducer is now coupling into air, then the transmit level is reduced, via step **420**.
>
> Additional control mechanisms may be added to the system or probe to determine whether a probe is in use. The additional mechanisms may be used separately or in conjunction with the algorithm stated above for increased accuracy. For example, electro-optical or electromechanical or physical switches added to the probe holder on the system notifies the system if the probe has been picked up by the user. Furthermore, sensors in the probe may detect when the probe is in use. The sensors may include:

(1) motion detectors

(2) optical emitter/detector pairs

(3) thermal sensors

The motion detector would simply detect movement of the probe, which primarily occurs during scanning. An optical emitter/detector pair would sense the amount of light reflected by the tissue. Obviously, both techniques could be used separately or in combination with the process shown in FIG. 4 to reduce the transmit power to the probe elements. By regulating the transmit voltage to the elements, the transmit sensitivity as well as the probe life and reliability are increased.

Accordingly, a system and method in accordance with the present invention detects when an ultrasound transducer is coupling energy into tissue or into the air. In so doing, the thermal performance of the transducer improves allowing an increase in the duration and level of excitation voltage used to transmit energy.

Based on the above observations, Emery discloses the use of a control mechanism in the system or probe in conjuction with the algorithm or process as shown in Fig. 4. Furthermore, sensors such motion detectors are used to detect movement of the probe during use (scanning) providing feedback control.

The examiner of record maintains the 103 rejections as presented in the previous office action for substantially the same reasons as discussed above with reference to claims 1, 9, 15 and 18.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

This examiner's answer contains a new ground of rejection set forth in section **(9)** above. Accordingly, appellant must within **TWO MONTHS** from the date of this answer

exercise one of the following two options to avoid *sua sponte* **dismissal of the appeal** as to the claims subject to the new ground of rejection:

(1) **Reopen prosecution.** Request that prosecution be reopened before the primary examiner by filing a reply under 37 CFR 1.111 with or without amendment, affidavit or other evidence. Any amendment, affidavit or other evidence must be relevant to the new grounds of rejection. A request that complies with 37 CFR 41.39(b)(1) will be entered and considered. Any request that prosecution be reopened will be treated as a request to withdraw the appeal.

(2) **Maintain appeal.** Request that the appeal be maintained by filing a reply brief as set forth in 37 CFR 41.41. Such a reply brief must address each new ground of rejection as set forth in 37 CFR 41.37(c)(1)(vii) and should be in compliance with the

/John F Ramirez/

Examiner, Art Unit 3737other requirements of 37 CFR 41.37(c). If a reply brief filed pursuant to 37 CFR 41.39(b)(2) is accompanied by any amendment, affidavit or other evidence, it shall be treated as a request that prosecution be reopened before the primary examiner under 37 CFR 41.39(b)(1).

Extensions of time under 37 CFR 1.136(a) are not applicable to the TWO MONTH time period set forth above. See 37 CFR 1.136(b) for extensions of time to reply for patent applications and 37 CFR 1.550(c) for extensions of time to reply for ex parte reexamination proceedings.

Respectfully submitted,

/John F Ramirez/
Examiner, Art Unit 3737

A Technology Center Director or designee must personally approve the new ground(s) of rejection set forth in section (9) above by signing below:

/Donald T. Hajec/
TC 3700 Director

Conferees:

/BRIAN CASLER/
Supervisory Patent Examiner, Art Unit 3737

/Janet C. Baxter/
TC 3700 TQAS

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